OFFICE OF MANNED SPACE FLIGHT PROGRAM DIRECTIVE	M-D MA 1400.088 (Project)	DATE 4/22/68

APOLLO PROGRAM DIRECTIVE NO 39

FROM: Samuel C. Phillips
APOLLO PROGRAM DIRECTOR

TO: DISTRIBUTION

SUBJECT: General Standard for Preservation, Packaging, Packing, Marking, Handling, and Shipping of Apollo Space Vehicle Components, Parts, and Associated Equipment.

REFERENCES:

(a) General Standard, Same Subject. (Attached)

(b) NHB 7500.1, Apollo Logistics Requirements Plan

(c) NMI 6410.1, Packaging, Preservation, and Marking Requirements for Aeronautical and Space End Items, Components, Parts, and Associated Equipment.

ACTION: Apollo/Saturn Program Managers will implement the requirements of this Directive effective with the issuance date. Management principles and policy considerations of the Apollo Logistics Requirements Plan (NHB 7500.1) are applicable.

I. PURPOSE

This Directive is to promulgate standard procedures for preservation, packaging, packing, marking, and shipping of high-cost or critical space vehicle components, parts and associated equipment, including GSE and RPIE. This Directive supplements Reference (b) and (c) above.

II. SCOPE

This Directive is applicable to all activities associated with, or responsible for, packaging, handling, or transportation of Apollo subsystems, components or items of a high-cost or critical nature.

NOTE: The office of Primary Responsibility for this publication and the attached Standard is APO, MAP-2. For updating purposes, the recommendations for revisions shall be submitted to this office.

III. ACTION REQUIRED

A. All applicable MSF Center Apollo/Saturn Program offices shall take immediate action to initiate use of the procedures prescribed in the attached standard. Each Center shall require this standard to be incorporated, by reference or appendage, to the following (prime contractors shall impose like requirements upon their subcontractors and vendors):

1. New Contracts

2. Existing Contracts

   a. when high-cost or critical items have been assessed as requiring additional protection as provided by this standard.

   b. when a contract amendment will involve no additional cost to the Government.

Existing contractor/industry specifications or standards may be used when the assessment of the packaging and handling requirements indicates their acceptability through test or experience.

B. MSF Center Apollo/Saturn Program offices shall identify and develop a master listing of high cost and critical subsystems and components requiring special handling.

C. Apollo/Saturn Program/Project Managers shall require periodic assessments to be made as to the implementation of this Directive. Each assessment shall include, but not be limited to:

1. The Apollo Program Logistics Management Office shall review periodically each Center to assure full compliance with this APD.

2. Designated offices within each Center shall review and assess in depth all intra-Center packaging, handling, and transportation elements as outlined in this Directive and the attached Standard. In addition, each Center shall assess their respective Apollo/Saturn contractors, subcontractors and vendors.

3. Each Center shall require Apollo/Saturn contractors to assess in-house activities and those of subcontractors and vendors for compliance with the Standard and any supplemental Center instructions.

4. When non-compliances or deficiencies exist, follow-up action shall be required by the organization having the responsibility for its implementation.

IV. SCHEDULE

Each Center shall submit a status report to the APO (MAP-2) within 15 days from the as of dates of June 30 and December 31, 1968. Status reports shall include, but not be limited to, the following:

A. Number of prime contracts under Center cognizance.

B. Number of new contracts incorporating the Standard.

C. Number of existing contracts amended to incorporate the Standard.

D. Number of items identified as critical or high-cost, by contractor.

E. Status of corrective actions required to modify the existing CEI specifications to conform to this Directive.

F. Reviews accomplished (paragraph C of Section III above), indicating significant adverse findings and the corrective actions taken.

G. Programmed actions for the next six months.

H. Supplements to the APD Standard published by the respective Centers reflecting supplement number and title (Reference paragraph 4.2 of the Standard).

V. RESOURCES

Funding and resources for accomplishment of paragraphs 1 and 2.a of Section II of this Directive shall be made from the current Apollo Program allocations.

Attachment

APOLLO STANDARD
FOR
PRESERVATION, PACKAGING, PACKING, MARKING, HANDLING, AND
SHIPPING OF SPACE VEHICLE COMPONENTS, PARTS,
AND ASSOCIATED EQUIPMENT.

1. SCOPE

1.1 Scope. - This standard defines the requirements for preservation, packaging, packing, marking, handling, and shipping of space vehicle components, parts, associated equipment and required spares which are categorized as high cost or critical items. Major contract end items which are of such unique nature that their packaging, preservation, shipping, handling, and storage necessitate the preparation of individual specifications governing these functions are specifically exempted from inclusion under this document; e.g., booster stages and spacecraft.

1.2 Application. - This standard shall be incorporated as a requirement in applicable existing and all future contracts that require preservation, packaging, packing, marking, handling, and shipping. Deviations and waivers from the requirements of this standard shall require written approval by the procuring activity.

2. APPLICABLE DOCUMENTS

2.1 The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposals shall apply.

SPECIFICATIONS

Federal

UU-T-81	Tags, Shipping and Stock.
101	Federal Standard - Preservation, Packaging Materials, Test Procedures
102b	Federal Standard - Preservation, Packaging and Packing Levels.

Military

MIL-P-116	Preservation, Methods of.
MIL-V-13811	Varnish, Waterproofing, Electrical Ignition.
MIL-I-26860	Indicator, Humidity, Plug, Color Change.

STANDARDS

Military

MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-726	Packaging Requirements Code.
MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of.
MS 26507	Indicator Card, Desiccant Relative Humidity (8% plus or minus 5%).

HANDBOOKS

Military

AFM 71-4	Packaging and Handling of Dangerous Materials for Transport by Military Aircraft.
MIL-HDBK-304	Military Standardization Handbook Package Cushioning Design.

PUBLICATIONS

National Aeronautics and Space Administration

NASA-MSFC MR #1262 (April, 1967)	Manual, Design Criteria for Shock and Vibration (Transportation).
NPC 200-2	Quality Program Provisions for Space System Contractors.
NPC 200-3	Inspection System Provisions for Suppliers of Space Materials, Parts, Components, and Services.
NPC 500-6	Apollo Documentation Administration Instructions.
NPC 500-1	Apollo Configuration Management Manual.
NMI 6410.1	Packaging, Preservation, and Marking (Policy and Responsibilities).

2.2 Other Publications. - The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposals shall apply.

Uniform Classification Committee

Uniform Freight Classification 8 (and revisions thereof)

(Application for copies should be addressed to the Uniform Classification Committee, J. P. Hackler, Chairman, 202 Union Station, Chicago, Illinois 60606).

American Trucking Associations, Inc.

National Motor Freight Classification - A-10 (and revisions thereof)

(Application for copies should be addressed to the American Trucking Associations, Inc., Accounting Dept., Order Section, 1616 P Street, N. W. Washington, D. C. 20036).

Post Office Department

Bullinger's Postal and Shippers Guide

(Application for copies should be addressed to Bullinger's Guides, Inc., 63 Woodland Avenue, Westwood, N. J. 07675.)

Department of Transportation

Official Air Transport Restricted Article Tariff #6-D (or revisions thereof)

(Application for copies should be addressed to Air Traffic Conference of America, 1000 Connecticut Avenue, N.W., Washington, D. C. 20936).

Tariff #19	Department of Transportation Regulations for Transportation of Explosives and Other Dangerous Articles by Land and Water in Rail Freight Service and by Motor Vehicle (Highway) and Water.

(Application for copies should be addressed to Agent T. C. George, 63 Vesey Street, New York, New York 10007).

49CFR 71-79	Department of Transportation Rules and Regulations for the Transportation of Explosives and Other Dangerous Articles

(The Department of Transportation regulations are now a part of the code of Federal Regulations [1949 Edition-Revised 1967] available from the Superintendent of Documents, Government Printing Office, Washington, D. C. 20402 [Rev. 1967].)

3. DEFINITIONS

3.1 Component. - An article which is normally a combination of parts, subassemblies, or assemblies and is a self-contained element with a complete operating unit.

3.2 Part. - The least subdivision of a thing; a piece that functions in interaction with other elements of a thing, but is itself not ordinarily subject to disassembly.

3.3 Associated Equipment. - Nonspace-vehicle equipment directly related to the manned space effort, including ground support equipment.

3.4 Item. - The word item(s) is used herein, for brevity, to indicate components, parts, equipment, or any combination of these terms.

3.5 Preservation. - Application or use of adequate protective measures to prevent deterioration from environmental hazards or conditions including, as applicable, the use of appropriate cleaning and drying methods, preservatives, and wrapping for protection from chemical danger.

3.6 Packaging. - Application or use of adequate protective measures to prevent damage from physical hazards or conditions, including: wrappings for protection from physical danger, cushioning, and complete identification marking of unit and intermediate containers.

3.6.1 Unit Package. - The first tie, wrap, or container applied to a single item, several items of the same identifying number or nomenclature, or a group of items included under one identifying number or nomenclature, preserved or unpreserved, which involves a complete or identifiable package.

3.6.2 Intermediate Package. - An interior container which contains two or more unit packages of identical items.

3.6.3 Special Design Packaging. - That packaging which is to be used for those items possessing characteristics which require specially designed cushioning, blocking and bracing, and/or specially designed containers to provide the necessary protection. The method or techniques of application are sufficiently complex so that standard descriptions are inadequate, and additional data is required to describe and/or depict them and require the approval of a packaging engineer/specialist. Special design packaging includes items which present:

a. Special handling, packaging or transportation problems because of restrictive shock or vibration characteristics, or

b. A requirement for special environmental control, or

c. A requirement for maintenance within special or critical pressure or temperature limits, or

d. A requirement for specialized container design, special handling devices, fixtures, etc.

3.7 Packing. - The final placement of items or packages in exterior shipping containers or other media including the necessary blocking, bracing or cushioning, weatherproofing, exterior strapping, and marking.

3.7.1 Repacking. - The act of performing preservation, packaging, packing and marking at a time later than when the original preservation, packaging, packing, and marking was accomplished.

3.8 Marking. - The application or use of marks, symbols, and addresses for purposes of guiding or directing the safe handling and shipping of packaged items.

3.9 Levels of Preservation, Packaging, and Packing. - For purposes of this standard, the following definitions of Level A, Level B, and Level C preservation, packaging, and packing shall apply.

3.9.1 Level A. - The degree of preservation, packaging, and packing which will assure adequate protection of an item against corrosion, deterioration, and physical damage during multiple shipment, handling, and storage for a period exceeding 1 year or under unknown conditions. This level is normally used for overseas or worldwide shipment.

3.9.2 Level B. - The degree of preservation, packaging, and packing which will assure adequate protection of an item against corrosion, deterioration, and physical damage during multiple shipment, handling, and enclosed storage for a period not exceeding 1 year.

3.9.3 Level C. - The degree of preservation, packaging, and packing which will assure adequate protection of an item against corrosion, deterioration, and physical damage during shipment from the supply source to the first receiving activity for immediate use, or environmentally controlled storage which is consistent with the requirements of the item.

3.10 Packaging, Handling, and Transportation Record (PHTR) - A form which defines the specific levels and means of preservation, packaging, packing, marking, handling, and shipping instructions for special designated items (see Figure 2). This record shall become a part of the Data Package and accompany the item up to the point of final installation or use. The format of the PHTR, when reproduced, shall not be altered in size or content.

3.11 Shipping and Handling. - The act of transporting and handling packaged and packed items from one place to another.

3.11.1 Special Handling. - Handling procedures requiring the special services of the Transportation Officer for the defect free shipment of program critical items from the supplier to point of final use. Special handling requires controlled movement of the package, with consideration given to vibration and shock amplitudes and durations, use of monitoring devices, and storage requirements, and other appropriate precautionary measures as applicable.

3.12 Classes of Shipping and Handling. - For the purpose of this standard, Class I, Class II, Class III, or Class IV shipping and handling categories shall apply to components, parts, and associated equipment and shall be defined as follows.

3.12.1 Class I. - Program critical items which, in the event of their loss, damage, or delay in shipment, would seriously impact the program schedule.

3.12.2 Class II. - Delicate or sensitive items not covered by Class I or by Class III. These items are those that are readily damaged by improper handling. Examples of Class II items are electronic devices.

3.12.3 Class III. - Items requiring special handling and monitoring. Class III items require a courier or monitoring instrumentation, and the details shall be defined by the procuring activity.

3.12.4 Class IV. - Those items that can be transported or handled through the use of normal commercial transportation.

3.13 Transportation Official. - The official assigned the central responsibilities for implementing the shipping and handling functions.

3.14 NASA Critical Item Label. - A standardized, distinctive label, prominently displayed on the exterior of all Class I, Class II, and Class III interior packages and exterior shipping containers (see Figure 1, page 12). The purpose of the labels is to alert all shipping and handling personnel of the criticality of the item to the manned space effort. The NASA Critical Item Label shall be obtained from the applicable procuring activity. The label form numbers and sizes are:

(a)	NASA Form 1368	4 by 8 inches
(b)	NASA Form 1368A	3 by 6 inches
(c)	NASA Form 1368B	2 by 3.5 inches

3.15 Program Critical Items. - Program critical items are those meeting one or more of the criteria listed below:

(a) Items of close tolerance, delicate construction, or perishable nature which if damaged, deteriorated, or contaminated would result in premature failure or malfunction of the equipment in which it is to be installed or to which it is related.

(b) Items not covered by (a) above but which, if damaged, deteriorated, or contaminated, would endanger personnel, equipment, or facilities by creating unsafe or hazardous operating conditions.

(c) Items not meeting the criteria of (a) or (b) above but which are so constructed that damage, deterioration, or contamination would result in excessive repair or overhaul costs, or create production or test delays because of long procurement lead time for replacement items.

3.16 High Cost Items. - Those items having a monetary value of $25,000.00 or more.

4. GENERAL REQUIREMENTS

4.1 Material and Procedure Selection. - The materials and procedures used in preservation, packaging, packing, marking, handling, and shipping shall be in accordance with the requirements specified herein. Preparation of the packaging requirements of CEI specifications shall be compatible with this Standard (Reference NCP 500-1).

4.1.1 Criteria for Selection. - The preservation, packaging methods and techniques shall insure protection of deliverable items against natural and induced environments (Reference MR #1262). A prerequisite to selection of preservation methods and packaging is the analysis of environments to which the equipment will be subjected during its life cycle. Such analysis shall include, but not be limited to, item fragility, induced shock and vibration forces resulting from handling and transportation, climatic or storage environments.

4.2 Detailed Standards. - Detailed standards may be prepared by the Centers to cover detailed requirements peculiar to specific space vehicle components, identified by the basic standard number and an identification number that indicates its position in order of promulgation; e.g., -MSFC-1, -2, etc. Each detailed standard shall be identified and listed in a supplement to this standard for record purposes.

4.2.1 Detailed Standard Precedence. - When the requirements of this standard and the requirements of the detailed standard conflict, the requirements of the detailed standard shall govern.

4.3 Documentation. - A PHT Record shall be used, as required, for items requiring special control and monitoring to specify preservation, packaging, packing, marking, handling, and shipping, and shall accompnay the shipment as a part of the Data Package. The cognizant Center Contracting Office shall insure the implementation of this requirement in the applicable contract. A copy of the PHTR shall be included in the Data Package and made available for review at the receiving activity.

4.4 Dangerous and Restricted Items. - The packaging and packing of items in accordance with this standard, which come within the scope of the Department of Transportation Rules and Regulations for the Transportation of Explosives or Other Dangerous Articles, 49CFR-71-79, and other applicable documents, shall be performed in accordance with Department of Transportation Regulations 49CFR-71-79, Tariff #19 or Tariff #6.D, Uniform Freight Classification Rules, and the National Motor Freight Classification Rules, as applicable. All items offered for military airlift shall be processed in accordance with the requirements of AFM 71-4.

4.5 Requirements for Testing. - When testing is a requirement, the tests shall be performed as specified in Standard MIL-STD-794, Appendix C. Damage to the exterior shipping container resulting from improper interior packaging, blocking, or bracing shall be cause for rejection. Structural failure of the exterior shipping container resulting in the spilling of contents or failure of the exterior shipping container in subsequent handling shall be cause for rejection. The superimposed load test shall not buckle, or cause failure to members in the sides or ends of the containers. There shall be no substantial shifting of contents within the exterior shipping containers that would cause damage during shipment, storage, or container reshipment. Tests shall be performed, when specified, on the unit or intermediate container in addition to the composite shipping pack.

4.6 Reliability. - The contractor shall ensure that selection of preservation and packaging methods, design of shipping containers, and shipping parameters are coordinated with the established reliability program. Retention of item reliability during storage and transportation shall be a major consideration.

4.7 Quality Assurance. - The contractor is responsible for the performance of all inspection requirements as specified herein, or in the detailed standard (4.2) unless procuring activity inspection is specified in the contract. The requirements specified herein include the requirements of specifications selected to perform the functions of preservation, packaging, packing, marking, and handling. The supplier

may use his own or any other inspection facilities and services acceptable to the procuring activity that are covered by an inspection or quality control plan required by the applicable NASA Quality Publication NPC 200-2 or NPC 200-3, as referenced in the contract. The inspection plan, as required by NASA Quality Publication NPC 200-3, shall be submitted for review with the supplier's bid or proposal. Inspection and test records shall be kept complete and, upon request, made available to the procuring activity or its designated representative in accordance with NASA Quality Publication NPC 200-2, NPC 200-3, or other provisions of the contract or procurement document.

4.8 Government Inspection. - The government reserves the right to actually perform any of the inspections set forth in standards or specifications where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements. The services of Defense Contract Administrative Service (DCAS) shall be used at those contractor establishments where other government inspection is not otherwise available.

5. DETAILED REQUIREMENTS

5.1 Levels of Preservation, Packaging, and Packing. - The levels of preservation, packaging, and packing shall be designated by Level A, B, or C, defined in 3.9 and are mandatory for use.

5.1.1 Special Design Packaging. - For those items possessing characteristics requiring special design packaging (see paragraph 3.6.3) the contractor shall develop and maintain packaging engineering data in sufficient detail to permit necessary review; implementation of the packaging specified therein; and preparation of PHT records as required by the applicable Data Requirements Documents.

5.2 Preservation and Packaging.

5.2.1 Material and Procedure Selection. - The materials and procedures used for preservation and packaging shall conform to one of the following:

(a) The requirements defined by the applicable portions of Standard MIL-STD-794 and MIL-P-116.

(b) The requirements specified on the approved PHTR.

(c) The requirements of the detailed standard (see 4.2).

5.2.1.1 Disassembly. - Unless otherwise specified, components shall remain assembled for shipment when reassembly in the field would require special tooling. Disassembly to facilitate packaging or to provide more effective packing procedures is permissible, when specified. Specific component disassembly shall be specified within the detailed drawing, contract, or order (see 5.10). When practical, bolts, nuts, screws, pins, and washers will be reinstalled and secured to one of the mating parts.

5.2.1.2 Matchmarking. - When necessary to facilitate reassembly or repackaging, removed parts shall be matchmarked as specified in the detailed standard or detailed drawing. Tags used for matchmarking shall conform to Type A of Specification UU-T-81. Tags shall be oversprayed with a material conforming to Specification MIL-V-13811 and then secured to the item.

5.2.1.3 Special Service Cleaning and Packing. - (Reference MIL-P-116) All packaging materials which will come in contact with parts or components to be used

in special service, such as LOX service, shall be approved by the procuring activity. A tag shall be affixed to each special service package to indicate the intended use of the item. The tag shall contain special unpackaging instructions. A seal or decal shall be affixed to the package in such a way that any attempt to open the package would result in mutilation of the seal or decal.

5.2.1.4 Item Segregation. - Critical/high cost items shall not be co-mingled with other items in any container.

5.3 Packing.

5.3.1 Material and Procedure Selection. - The materials and procedures used for packing shall conform to the requirement of paragraph 5.2.1.

5.3.2 Reusable Containers. - Containers shall be reused to the maximum extent. The determination for reuse shall be based on its capability to protect its contents. Reusable containers shall be placed in appropriate storage and identified by conspicuous display of statements depicting reuse and disposition of reusable containers.

5.3.3 Containers for Domestic Class IV Shipment. - Containers shall be light-weight, economical, and capable of withstanding single-trip shipments without damage occurring to enclosed packages. When gross weight of the shipment is over 150 pounds, or when the size is 20 cubic feet or greater, containers shall be mounted on skids or pallets to facilitate handling. Commercial type containers are acceptable for domestic shipment if test results indicate they provide adequate protection for the item(s).

5.3.4 Unpacking. - When required, unpacking instructions shall be given on the PHTR to prevent damage to the contents due to improper unpacking. The exterior container shall be marked to indicate that an unpacking procedure must be followed.

5.3.5 Restraining Systems. - For highway, air, rail, and marine shipments, items in their shipping configuration and skidded or wheeled equipment shall be provided with tie-down and lifting provisions commensurate with size, weight, mode of transportation, and carrier equipment involved. Additional margins of safety may be required during design of the restraining system because of peculiarities of the cargo, carrier safety considerations, or accident effects, especially where dangerous or hazardous materials are involved.

5.3.6 Protection of the Contained Item. - The type of container and its suspension or cushioning system shall be specified on the PHTR and shall protect the item from dynamic environments induced during shipping and handling. The item shall be secured and its movement controlled to prevent contact of the item with the container shell or support structure at other than the restraining points. A minimum requirement shall be the capability of the container to sustain a free fall of 42 inches without adverse affect on the contained item.

5.3.7 Determination of Item Fragility. - Vibration and shock qualification test amplitudes and durations, which have been approved by the procuring agency, shall be used to establish the maximum acceptable values that the packaged items will be allowed to encounter during shipping and handling. The acceptable amplitudes for the packaged items shall be such that an insignificant portion of the item life, demonstrated in vibration and shock environments, will be used during shipping and handling. Vibration isolation and/or vibration damping devices shall

be used to attenuate the transportation environment to acceptable amplitudes. Analysis and/or test results, which demonstrate the capability of the packing to reduce the transportation environment to an acceptable amplitude, shall be taken to ensure that no additional items are installed that have a lower fragility rating which would reduce the structural strength characteristics and invalidate the conditions under which the prime item was tested and the shipping fragility was established. Reference should be made to Handbook MIL-HDBK-304 for guidance in designing adequate shock/vibration isolation systems and for the environmental conditions which may be encountered.

5.3.8 Monitoring Devices for Class III Shipment. - Monitoring devices shall be of a type and nature that will detect or provide a permanent indication that the packaged contents have been subjected to adverse conditions that could impair their ability to perform their intended function in a satisfactory manner. These monitoring devices include, but are not limited to, those specified in this standard. The individual device and its use shall be subject to approval by the procuring activity. Monitoring devices shall be installed in a manner that will readily permit their observation and inspection with a minimum of assembly or disassembly of the container. The location of the device shall be prominently marked on the exterior container.

5.3.8.1 Humidity Indicators. - Humidity indicators shall be used with desiccants and should be located as far from the desiccant and as close to the container closure as possible. Humidity indicators required for mounting in rigid containers or flexible barriers shall conform to Specification MIL-I-26860. Card-type indicators that are to be placed within a barrier for viewing through provided inspection windows shall conform to Standard MS 26507.

5.3.8.2 Acceleration Devices. - Acceleration devices include limit detectors or those which provide a permanent record such as an indication of shock or vibration. These devices shall be positioned within the container in such a way that they will record an accurate indication of the conditions encountered by the contents of the containers.

5.3.8.3 Pressure Devices. - Pressure devices shall be capable of providing a permanent indication or record of atmospheric pressure levels that occur above or below specified limits.

5.3.8.4 Temperature Devices. - Temperature sensing devices shall be capable of providing a permanent indication or record of temperature levels that occur above or below specified limits.

5.4 Marking.

5.4.1 Marking Procedures. - The procedures used for marking unit packages, intermediate packages, and exterior shipping containers shall conform to the requirements specified in this standard and to Standard MIL-STD-129, or to the detailed standard unless otherwise specified on the PHTR.

5.4.2 NASA Critical Item Label. - Interior packages and shipping containers for items designated as Class I, Class II, and Class III shall carry the "NASA Critical Item Label." One of these labels shall be affixed to each of the sides of the container. Whenever these labels will interfere with the markings as required in 5.4.1, one of the NASA warning labels may be omitted (see Figure 1).

5.4.3 Shelf Life. - The expiration of the shelf life of the item and the shelf life of the preservation, packaging, and packing shall be marked on the exterior container.

5.5 Change in Levels of Preservation, Packaging, and Packing. - All items which are designated for immediate use or short term storage and packaged commensurate to that level shall be accompanied with repackaging instructions providing for the contingency of increased term of storage. The PHT shall include these instructions or provide the name and address of the authority from whom instructions may be obtained. Similarly, instructions shall be made available to provide for the contingency that the type of storage may be of a lesser degree of controlled condition than that which was planned at the time the items were originally packaged.

5.6 Packaging Integrity. - Assurance shall be given that the integrity of long term storage packaging is not violated. Packaging used for long term storage and should not be opened until the item contained therein is to be removed from storage. Repackaging instructions and reusable containers shall be provided for all items which are to undergo receiving inspection calibration or periodic recalibration, etc. Items of this nature shall be so specified on the PHTR and have markings used on their packages to so indicate. All long term storage packages which are opened prematurely shall be repackaged with the same degree of quality assurance provided as the original package to assure that the intent of their level of packaging has not been violated.

5.7 Shipping and Handling.

5.7.1 Classes of Shipping and Handling. - The classes of shipping and handling shall be designated by Class I, II, III, or IV, as defined in Section 3, and are mandatory for use.

5.7.2 Preparation for Shipment. - The preparation for shipment shall include preservation, packaging, packing, and marking in accordance with the requirements of this standard or the detailed standard.

5.7.3 Special Handling. - When special handling procedures are required (Class II shipping), the procedures shall be specified in the PHT Record. The elimination of transfer points is recommended to prevent physical damage and unwarranted exposure to hostile conditions. The transportation official shall assure compliance with special handling requirements.

5.7.4 Modes of Shipping. - The modes of shipping shall be determined by the transportation official in accordance with the classes of shipping and handling and shall influence the packaging and packing requirements.

5.7.5 Shipping Media. - Shipping requirements shall be specified for each Class I, II, and III item and shall include:

(a) Mode of Transport

Air
Highway
Rail
Marine

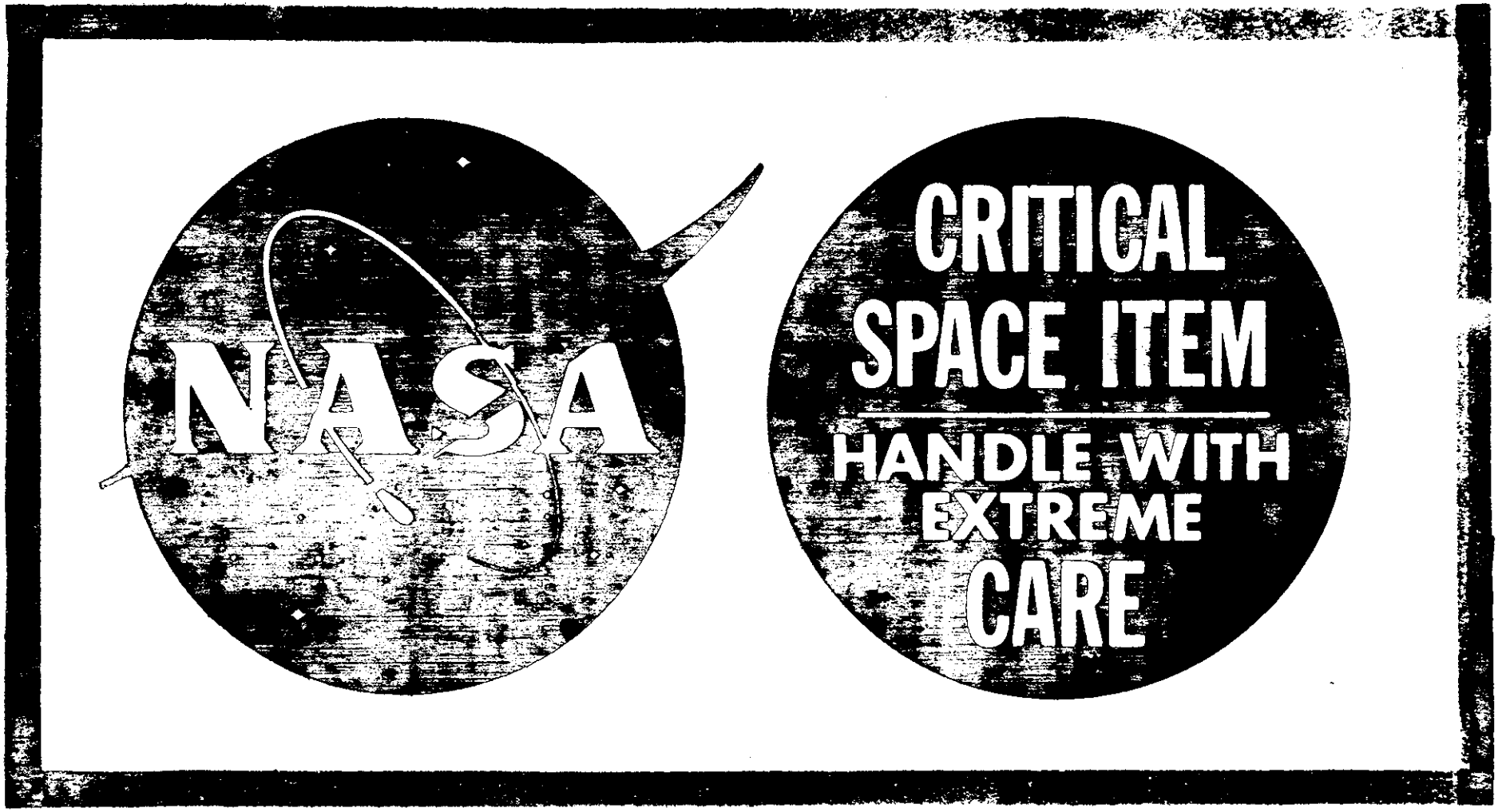

FIGURE 1 NASA CRITICAL ITEM LABEL

(b) Type of Equipment

Open (vehicle)
Covered
Air suspension and/or padded van
Exclusive use (chartered)
Special materials handling
Transporting dollies
Special containers

5.8 Surveillance of Shipping and Handling. - The transportation official is responsible for maintaining surveillance over each Class I, II, and III item to the degree dependent on its assigned class. The transportation official shall, as required:

(a) Assure that inspection at the supplier's facility has been performed prior to shipment to verify compliance with the PHTR.

(b) Assure that NASA Critical Item Labels have been affixed to the shipping containers.

(c) Provide shipment routing and notify in-route transfer agents.

(d) Provide advance shipping and handling information to all responsible activities.

(e) Provide in-route escort or courier.

(f) Assure that sensing devices are used to alert receiving or unwarranted exposure to adverse conditions.

(g) Assure that the shipment movement complies with the shipping and handling cycle of the item including point of final use.

(h) Coordinate receiving procedures, including receiving inspections, quality control and final installation of storage of the packaged item.

5.8.1 Class IV Items. - The transportation official shall assure that the most advantageous commercial transportation practice in the best interest of the government is used.

5.9 Packaging, Handling, and Transportation Records. - Packaging data to be developed and provided shall be identified at the earliest possible date on the Contractors' Data Requirements List (DRL), or equivalent, contained in the contract. This information shall be transferred from the contractors' engineering file to the PHTR for special monitoring of the item throughout the shipping and handling phase.

5.10 Ordering Data. - Procurement documents shall specify as a minimum the following:

(a) Date and number of this standard.

(b) Those items which require a PHTR.

(c) Whether the procuring activity will supply the PHTR.

(d) Whether specific disassembly is allowed.

(e) Level of preservation and packaging required.

(f) The class of shipment.

(g) Specific packing instructions, if required.

(h) Specific marking instructions, if required.

(i) The appropriate code of Standard MIL-STD-726, if used.

Notice. - When Government drawings, specifications, or other data are used for any purpose other than in connection with definitely related Government procurement operations, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

APPENDIX A
DEFINITIONS AND INSTRUCTIONS FOR PACKAGING, HANDLING, AND TRANSPORTATION RECORD (PHTR) PREPARATION

The following definitions and instructions identified by space numbers apply to preparation of the PHTR shown on Figure 2.

1. Record Serial Number. - The control number assigned by the activity that prepares the PHTR.

2. Date. - The calendar date the PHTR was originated.

3. Nomenclature. - Nomenclature as it appears on the part, drawing, or definition.

4. Part Number. - The number that identifies the part.

5. Federal Stock Number (FSN). - The eleven digit number assigned to the item (if an FSN exists).

6. Vendor/Contractor Name. - The name of the organization that manufactures the item.

7. Contract Number. - The number assigned to the contract.

8. Purchase Order Number. - The procuring activity purchase order number (if handled by purchase order).

9. Drawing Number. - The engineering drawing number of the item being packaged.

10. Levels of Preservation, Packaging, and Packing. - The applicable level of preservation, packaging, and packing as described in this standard. Special packaging (other than levels specified in this standard) is indicated by checking "other" block and specifying special requirements in space provided (see 3.9, 4.1.1, and 5.1). An "X" inserted in the appropriate box shall indicate the level of preservation and packaging; an "O" shall indicate the level of packing.

11. Item Description. - The length, width, height, net weight, material, and surface finish of the item to be packaged.

12. Option 1, Preservation, Packaging, and Packing. - Method of preservation, packaging, and packing conforming either to a specified method described in Sepcification MIL-P-116, appropriate industrial/commercial standard, e.g., Aerospace Standard NAS-850, or special method as described (see 5.2.1).

13. Quantity Per Unit Container. - The number of units (e.g., each, set, gallon, etc.) to be packaged in the first or unit container.

14. Unit Wraps. - Usually the first or intimate protection given to the item. Use approved specifications or other procuring activity approved material (see 5.3.1).

15. Cushioning/Dunnage. - The cushioning/dunnage type conforming to Specification MIL-P-116, or other material approved by procuring activity (see 5.3.1).

16. Unit Container. - The type and material of the first enclosure of the unit (e.g., wrap, bag, box, etc.). These materials shall conform to specifications approved by the procuring activity (see 5.3.1).

17. Intermediate Container. - The number of unit containers to be packed in one intermediate container, and the type and material of the enclosure which is usually a box that consolidates and protects the unit containers. The use of intermediate containers is not mandatory (see 5.3.1).

18. Option 2, Preservation, Packaging, and Packing. - This is an EDP application of blocks 12 through 17 above. The applicable code of Standard MIL-STD-726, if this option is used (see 5.2.1).

19. Shipping Container Type. - The structure that contains the intermediate or unit container and provides protection to the items during shipment. The shipping container may in some conditions be the unit container in which case it will also be the handling and storage container (see 5.3.2 and 5.3.3).

20. Shipping Container Data. - The specific physical container details (length, width, depth, and weight). Length, width, and depth shown in inches (to the nearest inch), cube shown to the nearest cubic foot, and gross weight to the nearest pound (see 5.3.3).

21. Marking. - The marking, in accordance with Standard MIL-STD-129, that is to be placed on the shipping or storage container. Additional space is provided under item 27 if special marking information is required (see 5.4.1).

22. Shelf Life. - The expiration date of shelf life of the item. If more than one item and dates differ, use earliest date.

23. Class of Shipment. - The class of shipment as specified in this standard (see 3.12 and 5.7.1).

24. Handling Transportation Constraint, Levels, and Monitoring Methods. - The constraints (special controls) levied on the item of supply that requires special monitoring (shock forces, temperature, flashpoint, etc.) State the levels, the number, location, and type of monitoring device, and if instrumentation is required. Additional space is provided under item 27 if special handling information is required (see 5.3.8).

25. Special Handling Instructions. - The special handling instructions including handling inplant, at receiving stations, on-sight storage, movement to final destination, and other handling instructions as applicable (see 5.7.3). If special unpacking procedures are required, they shall be so reflected in this block. Also note in this block if special protective containers are required not now provided by the item package.

26. Mode of Shipment. - The primary and alternate, if possible, modes of shipment (see 5.7.4 and 5.7.5).

27. Additional Notes. - Attach additional sheets as required covering detailed instructions, diagrams, quality assurance requirements, and drawings that can not be shown in the space provided.

28. Packaging Data Submitted By. - The legible signature of the originator of the PHTR. This is normally a contractor packaging engineer who submits the packaging data. However, this could be a government procuring activity packaging engineer if the packaging and shipping data originates at a government installation.

PACKAGING, HANDLING TRANSPORTATION RECORD (PHTR)

1. RECORD SERIAL NUMBER
2. DATE
3. NOMENCLATURE
4. PART NUMBER
5. FEDERAL STOCK NUMBER
PAGE ___ OF ___
6. VENDOR/CONTRACTOR NAME
7. CONTRACT NUMBER
8. PURCHASE ORDER NUMBER
9. DRAWING NUMBER

PRESERVATION, PACKAGING, AND PACKING

10. LEVELS
LEVEL A ☐ LEVEL B ☐ LEVEL C ☐ OTHER ☐ (SPECIFY)

11. ITEM DESCRIPTION — LENGTH — WIDTH — HEIGHT
NET WT. — MATERIAL — FINISH

OPTION 1 (SPACES 12-17)

12. PRESERVATION
☐ METHOD PER MIL-P-116
☐ OTHER (SPECIFY)

13. QUANTITY PER UNIT PACK
14. UNIT WRAPS

15. CUSHIONING - DUNNAGE
OR THICKNESS — TYPE

16. UNIT CONTAINER
MATERIAL — TYPE

17. INTERMEDIATE CONTAINER
MATERIAL — TYPE — UNIT QUANTITY

OPTION 2 CODE PER MIL-STD-726

18. OPTION 2 CODE PER MIL-STD-726

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23

SHIPPING DETAILS

19. CONTAINER TYPE

REUSEABLE - ☐ YES ☐ NO

20. SHIPPING CONTAINER DATA (IF ADDITIONAL SPACE REQUIRED, USE SPACE 31)

LENGTH FT	LENGTH IN	WIDTH FT	WIDTH IN	DEPTH FT	DEPTH IN	CUBE	GROSS WEIGHT
						CU FT	LBS

21. MARKING
☐ PER MIL-STD-129
☐ OTHER

22. SHELF LIFE EXPIRATION DATE

23. CLASS OF SHIPMENT

24. HANDLING TRANSPORTATION CONSTRAINTS

CONSTRAINTS	CRITICAL LEVELS	MONITORING METHOD (SPECIFY)
☐ CONTAMINATION		
☐ HUMIDITY		
☐ TEMPERATURE		
☐ PRESSURE		
☐ VIBRATION (SHOCK, ETC.)		
☐ FLASHPOINT		
☐ OTHER		

25. SPECIAL HANDLING INSTRUCTIONS (SPECIFY DETAILS WHERE APPLICABLE)
☐ INPLANT MOVEMENT
☐ INPLANT STORAGE
☐ TRANSPORTATION (INCLUDING P & D)
☐ ONSITE STORAGE
☐ ONSITE MOVEMENT
☐ OTHERS

26. MODE OF SHIPPING
PRIMARY
ALTERNATE

27. ADDITIONAL NOTES, SKETCHES, SPECIAL INSTRUCTIONS, QUALITY CONTROL REQUIREMENTS (PER MPC 200-2) (ATTACH SUPPLEMENTAL SHEETS AS REQUIRED)

28. PACKAGING DATA SUBMITTED BY
29. CHECKED BY
30. PREPARING ACTIVITY APPROVAL SIGNATURE
31. TRANSPORTATION OFFICIAL SIGNATURE
32. PROCURING ACTIVITY APPROVAL SIGNATURE
33. LOCATION
34. TELEPHONE NUMBER
35. DATE

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FIGURE 2.

29. Checked By. - The legible signature of the individual who verifies the PHTR. This includes checks by the activities responsible for the design of the item; the activities responsible for preservation, packaging, packing, storing, and handling of the item; and the activities responsible for the quality assurance functions related to monitoring the item.

30. Preparing Activity Approval Signature. - The legible signature of individual responsible for final approval of the data developed for the item covered by the PHTR. This is normally a contractor representative but would be a government procuring activity representative if the PHTR originates at a government installation. This signature verifies approval by the preparing activities' organizational activities responsible for design; preservation, packaging, packing, shipping, and handling; and quality assurance.

31. Transportation Official Signature. - The legible signature of the contractor's transportation official who is responsible for the adequacy of transportability considerations, routing and shipping, and monitoring during shipment (see 3.13).

32. Procuring Activity Approval Signature. - The legible signature of the procuring activity representative (Government contracting officer's representative - COR) who is responsible for the final approval of the PHTR (**in certain cases this function may be delegated to the contractor**).

33. Location. - The physical location of the individual shown in item 32.

34. Telephone. - The telephone number of the individual shown in item 32.

35. Date. - The calendar date the PHTR is approved by individual shown in item 32.